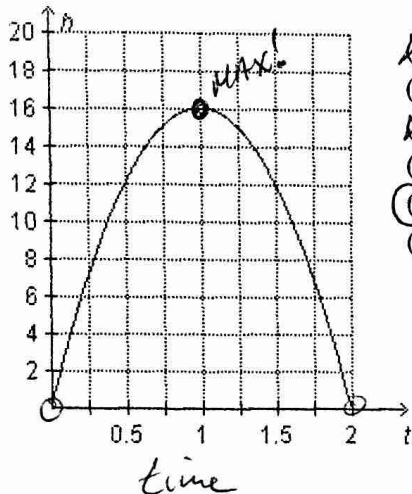
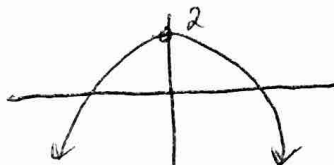


1) The graph shows the height,  $h$ , in feet, of a football at time  $t$ , in seconds, from the moment it was kicked at ground level. Which statement(s) best illustrates the situation?



- (1) The ball reaches a maximum height after ~~16~~ seconds.
- (2) The ball reaches a maximum height after 1 second. ✓
- (3) The ball is increasing in height between 1 to ~~2~~ seconds in the air.
- (4) The ball is in the air for a total of 2 seconds. ✓
- (5) Both (2) and (4)
- (6) Both (3) and (4)

5



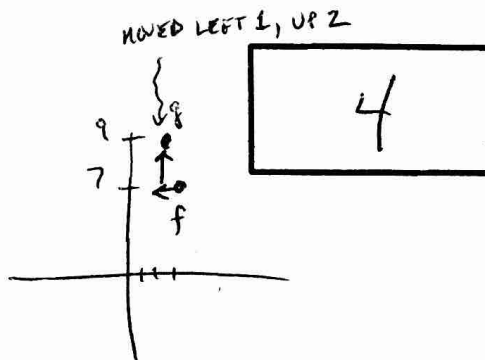
2) If  $f(x) = -x^2 + 2$ , then which of the following statements is true?

1

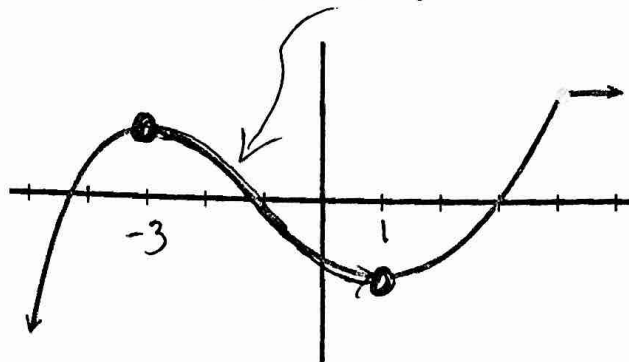
- (1) The maximum value is 2. The domain is all real numbers and the range is  $y \leq 2$ . The function is increasing to the left of  $x = 0$  and decreasing to the right of  $x = 0$ . ✓
- (2) The minimum value is 2. The domain is all real numbers and the range is  $y \geq 2$ . The function is decreasing to the left of  $x = 0$  and increasing to the right of  $x = 0$ .
- (3) The minimum value is  $-2$ . The domain is all real numbers and the range is  $y \geq -2$ . The function is decreasing to the left of  $x = 0$  and increasing to the right of  $x = 0$ .
- (4) The maximum value is  $-2$ . The domain is all real numbers and the range is  $y \leq -2$ . The function is increasing to the left of  $x = 0$  and decreasing to the right of  $x = 0$ .

3) If the point  $(3, 7)$  is on the graph of  $f(x)$ , and the point  $(2, 9)$  is on the graph of  $g(x)$ . Which transformation shows  $f(x)$  mapping to  $g(x)$ ?

- (1)  $f(x-1)-2$
- (2)  $f(x+1)-2$
- (3)  $f(x-1)+2$
- (4)  $f(x+1)+2$



4) For what domain interval is the function decreasing?



2

(1)  $-\infty < x < -3$

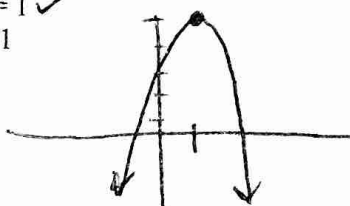
(2)  $-3 < x < 1$

(3)  $-3 \leq x \leq 1$

(4)  $4 < x < \infty$

5) Which of the following statements best describes the quadratic function  $f(x) = -2(x-1)^2 + 5$

- ~~1)  $f(x)$  is increasing on the right of  $x = 1$~~
- 2)  $f(x)$  is increasing on the left of  $x = 1$  ✓
- 3)  $f(x)$  is decreasing on the right of  $x = 1$  ✓
- ~~4)  $f(x)$  is decreasing on the left of  $x = 1$~~
- 5) Both 1 and 4
- 6) Both 2 and 3



6

6) A projectile's height  $h(t)$  above ground is a quadratic function of time  $t$  in seconds since launched. Three values of the function are given in the table below.

$t$	$h(t)$
0	80
2	144
4	80

$h(0) = 80$

What is the practical interpretation of  $h(0)$ ?

- 1) It is the time it takes the projectile to hit the ground.
- 2) It is the initial speed of the projectile.
- 3) It is the height of the projectile above the ground the instant it is fired. ✓
- 4) It is ground level.

3

7) If  $f(x) = -2x^2 + 5x + 2$ , what is the average rate of change on the interval  $[-1, 4]$ ?

1) 1

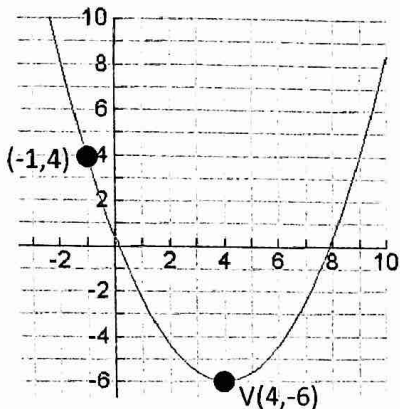
2) -1

3) 5

4) -10

$$\frac{f(x_2) - f(x_1)}{x_2 - x_1} = \frac{-10 - (-5)}{4 - (-1)} = \frac{-5}{5} = -1$$

8) Write an equation in *vertex form* for the quadratic function pictured below:



$$y = \frac{2}{5}(x-4)^2 - 6$$

$y = a(x-4)^2 - 6$   
 NOW PLUG IN  $(-1, 4) \Rightarrow x = -1$   
 $y = 4$

$$4 = a(-1-4)^2 - 6$$

$$4 = a(-5)^2 - 6$$

$$+6 \quad +6$$


---


$$10 = a(25)$$

$$\frac{10}{25} = \frac{a}{25}$$

$$a = \frac{2}{5}$$

8) The height of an object above the ground is described by the function  $f(x) = -16t^2 + 15t + 20$ .

a) What is the initial height of the object (at time  $t = 0$ )?

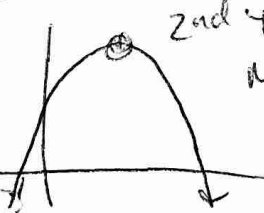
"C" value

$$20 \text{ ft}$$

b) What is the maximum height reached by the object (to the nearest tenth of a foot)?

\*OR USE  
THE TABLE  
(MUST COPY TABLE  
ON PAPER)

(CHANGE TO 10<sup>th</sup>s ON TABLE)



MAX:

$$(0.46875, 23.515625)$$

$$23.5 \text{ ft}$$

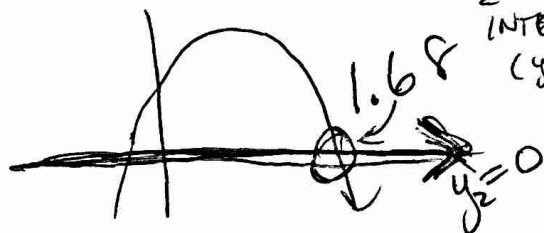
c) When does this maximum height occur (to the nearest tenth of a second)?

This will  
Allow you  
to find answers  
to nearest 10<sup>th</sup>.

$$0.46875$$

$$0.5 \text{ secs}$$

d) When does this object hit the ground (to the nearest tenth of a second)?



2nd TRACE  
INTERSECT  
(y=0)

$$1.7 \text{ secs}$$

9) Find the values of  $x$ ,  $y$ , and  $z$  in the following system of equations:

$$x + 2y - z = 3$$

$$2x + y + z = 0$$

$$x + 2y + z = 5$$

MULTIPLE APPROACHES!

$$\boxed{\begin{matrix} x = -2 \\ y = 3 \\ z = 1 \end{matrix}}$$

10) Given the function  $f(x) = \frac{2}{3}(x+4)^2 + 1$ , graph  $f(x)$  and find each of the following:

Vertex:

$$(-4, 1)$$

Focus:

$$\left(-4, 1 + \frac{3}{8}\right)$$

Directrix:

$$y = \frac{5}{8}$$

$a = \frac{1}{4p}$   
 $\downarrow$   
 $\sqrt{(-4, 1)}$   
 $p = ?$

